

# LASSO Equity Report: Large Class One

## Introduction

The following report analyzed the LASSO data from the course. First the overall course data is summarized and presented with, if available, comparisons to a large collection of other courses that used the same instrument. Then the report looks at differences across demographic groups for gender, race, and first generation status. Large-scale comparative data was not available for the investigations across demographic groups at the time the report was created.

To facilitate comparisons, shifts or differences are reported using Cohen's  $d$  with Hedges' correction. Cohen's  $d$  describes the differences between two datasets in terms of the standard deviations of those datasets. Hedges' correction adjust for overestimates in Cohen's  $d$  when the sample is less than 20. Readers should not apply rules of thumb to interpret these effect sizes (see Kraft, Ed. Res., 2020). Instead, readers should use context to interpret these results. When possible we have provided visualizations to compare the course data to a larger set of courses. This can illustrate that a seemingly large effect size is still below average. For comparisons of demographic groups, we recommend using the shifts for the course or the differences across demographic groups before and after instruction as context for interpreting the effect sizes.

# Summary of the course overall

Table 1: Test means and completion rates for the course.

Time	N in Course	N Completed	Completion Rate	Mean	Std. Dev.
Post	550	331	0.60	71.68	18.22
Pre	550	264	0.48	42.29	19.50

Table 2: Change in test scores.

Effect Size	CI low	CI high
1.56	1.35	1.81

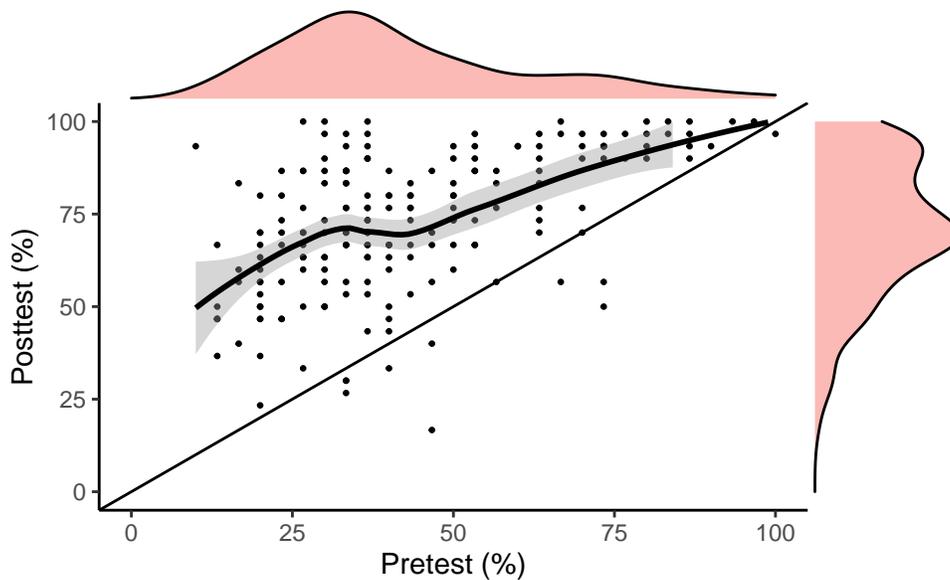


Figure 1: Scatter and density plots for the course with a LOESS line of best fit. The gray area represents the 95% confidence interval for the fit line.

## Comparison to similar courses

If available, the following section compares the course data to other courses that used the same instrument.

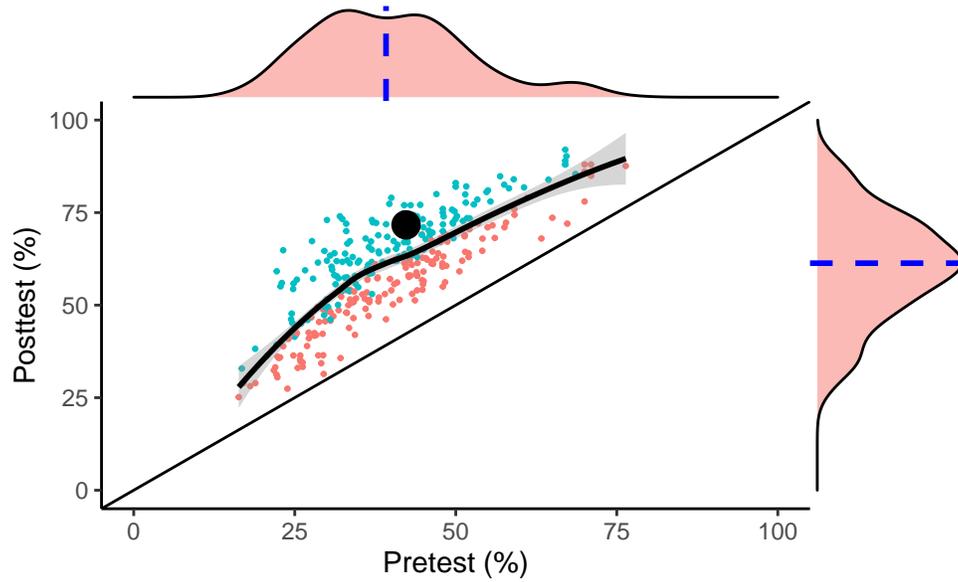


Figure 2: Scatter and density plots for a large collection of other courses that used the same instrument with a LOESS line of best fit. The gray area represents the 95% confidence interval for the fit line. The course's mean score is represented by the large black dot.

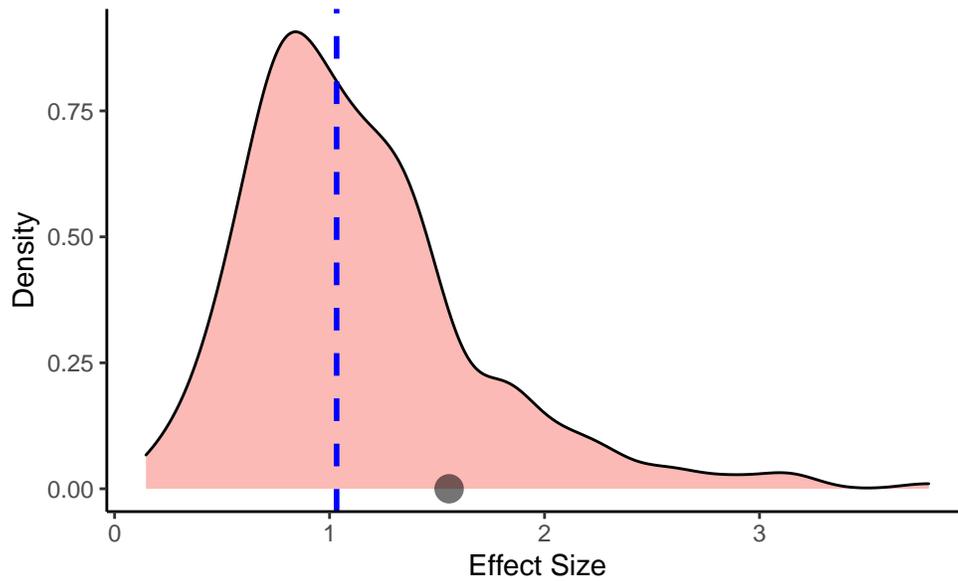


Figure 3: Density plots of effect sizes for a large collection of other courses that used the same instrument with the median effect size represented by the blue line. The black line represents the effect size for the course.

# Equity

The LASSO team approaches equity from a Critical Race Theory framework of societal educational debts (Ladson-Billings, 2006). Society owes educational debts to students from marginalized groups because of the systemic inequalities in opportunities society has provided those students compared to students from advantaged groups. LASSO administered instruments often measure these educational debts in pretest scores as differences in the distributions of scores for students from advantaged and marginalized groups. Courses can eliminate, maintain, or increase societal educational debts. The following sections explore educational debts in your course across three axes of oppression: sexism, racism, and classism. While likely a positive sign, the lack of a societal educational debt on a measure does not mean that equity has been broadly achieved. Oppression is a complex societal force and many different streams of information are necessary for understanding the relationship between oppression and education. LASSO provides some, but never all, of those streams of information.

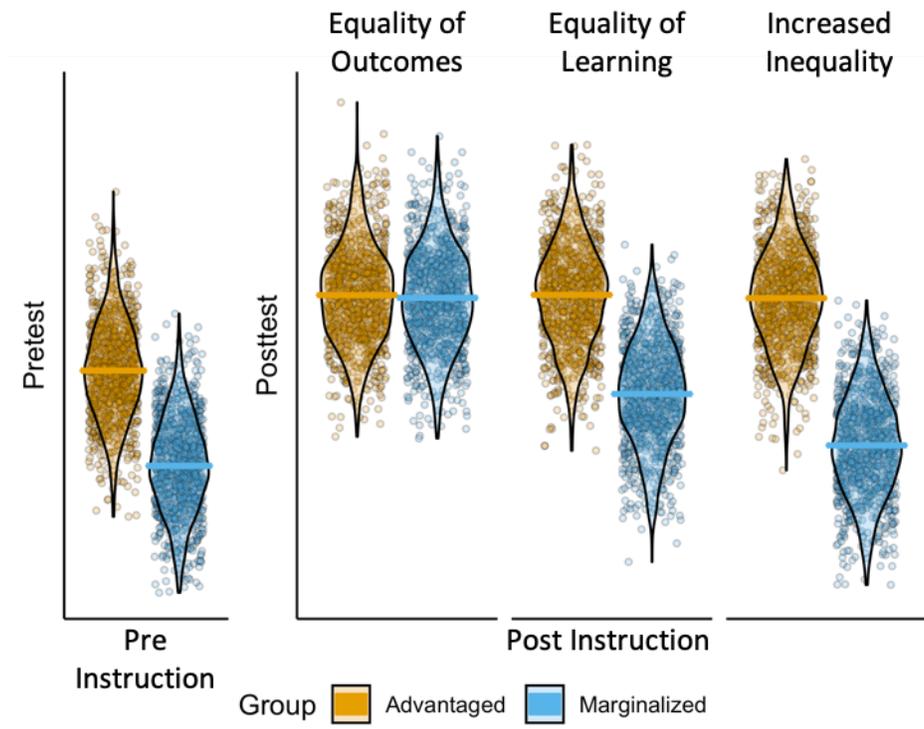


Figure 4: Educational Debts

## Limitations

LASSO data has a limited capacity to address issues of equity. Many groups face extensive marginalization to the point that very few students from those groups may be in a course. We have limited the analyses to groups with ten or more students. To simplify the analyses this means that the code only looks at differences for men and women, presents several different aggregations for looking at racism, and does not include an intersectional analyses to investigate how racism, sexism, and classism interacted to shape student outcomes in your course.

We limited the analysis to groups of 10 or more to balance confidence in the estimates, which benefits from larger samples, with allowing for including more demographic groups in the report and making the report useful to smaller courses or courses with less diverse enrollments. Our concern with presenting results from very small samples is the tendency for everyone to focus on the means and ignore uncertainty in those means.

The gender analysis only present results for the men and women. The demographic questions collect data for several additional identities. In working with the large-scale data from the LASSO platform relatively few students identify with other genders. If anyone needs analysis for other groups, they can modify the code themselves or provide us with the descriptive statistics and we will make the necessary changes.

The race and ethnicity analysis groups identities into Asian, American Indian and Alaskan Native (AIAN), Black, Hispanic, Middle Eastern and North African, Pacific Islander or Hawaiian Native, and White. Most of these demographic groups come from the US census. We have added Middle Eastern and North African to the census demographic groups because the census limits those students to identifying as White. Including this identity may better inform equity and better respects students identities.

We also provide two additional comparisons of aggregations of students comparing White and BIPOC students and URM and non-URM students. These are detailed below. These comparisons may be useful in courses where the comparisons across racial groups are not useful.

We include analysis by students self-reported first generation status.

Intersectionality. We believe that intersectionality across identities should be accounted for in analysis, but we have not included it here because of the complexity in creating a tool that could handle so many different scenarios. If users request specific intersectional reports we will add them.

## Gender Equity

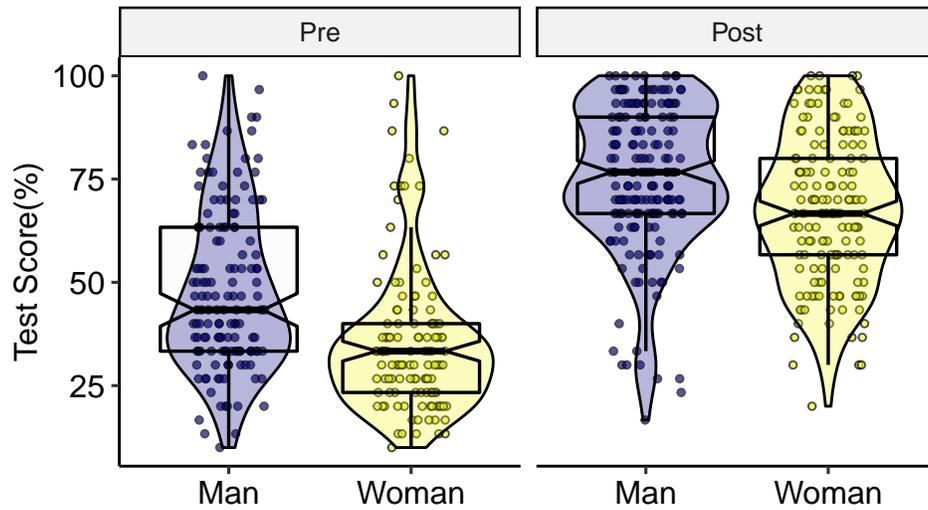


Figure 5: Distributions of test scores for men and women.

Table 3: Summary statistics disaggregated by gender.

Gender	Time	N Total	N Completed	Mean	Std. Dev
Man	Pre	231	142	47.89	19.23
Man	Post	231	178	75.30	17.79
Woman	Pre	190	120	35.75	17.90
Woman	Post	190	153	67.47	17.86

Table 4: Shift in test scores for each gender.

Gender	N	Effect Size	CI low	CI high
Man	231	1.48	1.20	1.81
Woman	190	1.77	1.43	2.16

Table 5: Gender differences before and after instruction.

Time	N Men	N Women	Effect Size	CI low	CI high
Pre	231	190	0.65	0.40	0.94
Post	231	190	0.44	0.22	0.67

## Race Equity

Races with more than 10 students

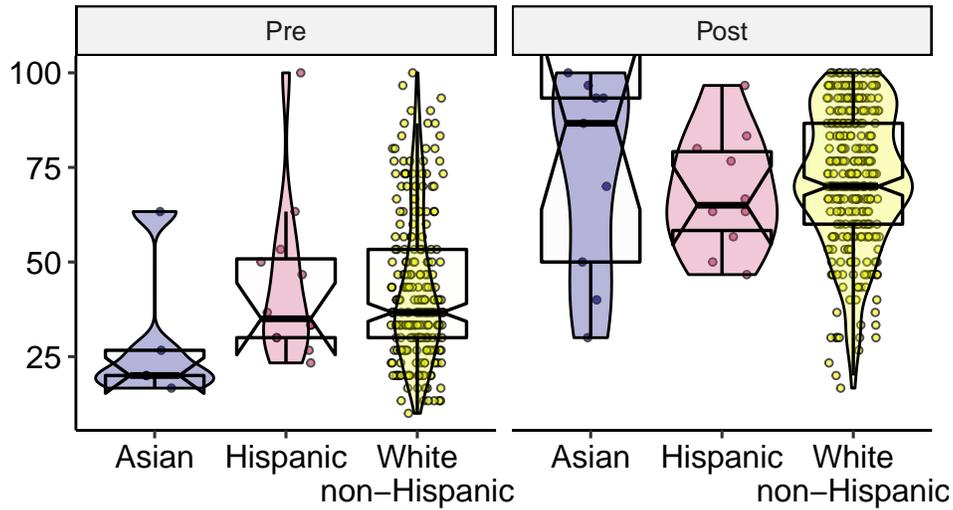


Figure 6: Distributions of test scores by race for racial groups with ten or more students.

Table 6: Summary statistics disaggregated by race.

Race	Time	N Total	N Completed	Mean	Std. Dev
Asian	Pre	16	5	29.33	19.35
Asian	Post	16	9	73.33	26.87
Hispanic	Pre	16	12	43.89	21.41
Hispanic	Post	16	10	68.33	15.73
White non-Hispanic	Pre	383	241	42.38	19.27
White non-Hispanic	Post	383	305	71.97	18.02

Table 7: Shifts in scores disaggregated by race.

Race	N	Effect Size	CI low	CI high
Asian	16	1.88	0.71	4.76
Hispanic	16	1.30	0.35	3.08
White non-Hispanic	383	1.59	1.38	1.84

\*Note these effect sizes don't include Hedge's correction because of a bug I haven't solved yet.

## White and BIPOC students

The following section disaggregates the data between Black Indigenous and People of Color (BIPOC) students and non-Hispanic White students. Many courses may be small enough or homogenous enough that a finer grained disaggregation of the data is unreliable. BIPOC provides a contrast to the NSF's definition of URM, which is presented in the next section.

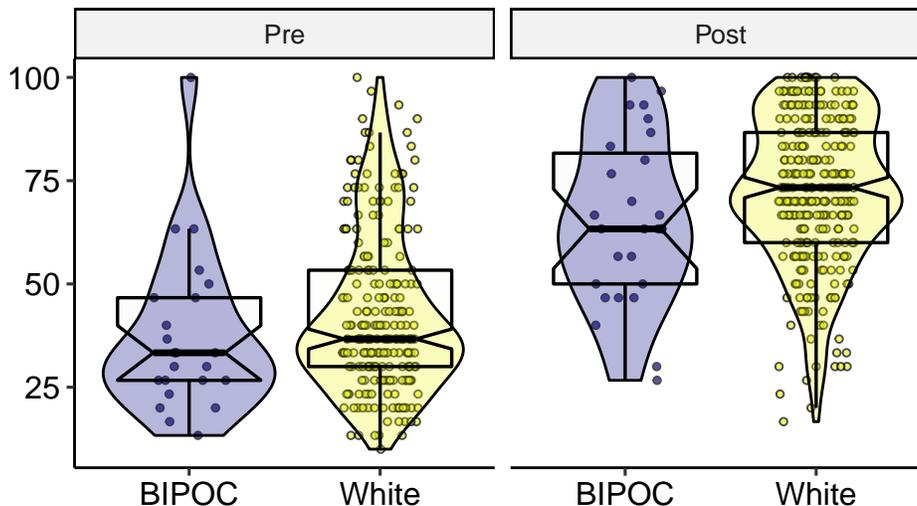


Figure 7: Distributions of test scores by race for racial groups with ten or more students.

Table 8: Summary statistics disaggregated by demographic group.

Demographic group	Time	N Total	N Completed	Mean	Std. Dev
BIPOC	Pre	42	23	37.39	19.41
BIPOC	Post	42	27	65.56	20.17
White	Pre	367	233	42.73	19.28
White	Post	367	293	72.31	17.91

Table 9: Shifts in scores disaggregated by demographic group.

Demographics	N	Effect Size	CI low	CI high
BIPOC	42	1.40	0.79	2.29
White	367	1.59	1.37	1.84

## URM Status

We present results disaggregated by under represented minority status to align with user’s needs related to NSF funded projects. In the following section non-URM includes non-Hispanic White and non-Hispanic Asian students. Students who identified as any other race are categorized as URM.

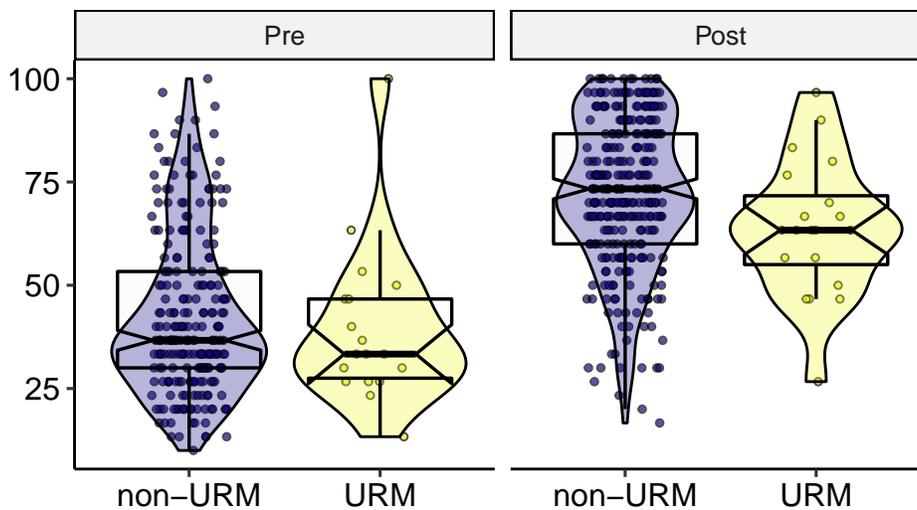


Figure 8: Distributions of test scores by under represented minority status.

Table 10: Summary statistics disaggregated by demographic group.

Demographic group	Time	N Total	N Completed	Mean	Std. Dev
non-URM	Pre	381	238	42.45	19.34
non-URM	Post	381	300	72.27	18.19
URM	Pre	28	18	39.63	19.37
URM	Post	28	20	63.83	16.52

Table 11: Shifts in scores disaggregated by demographic group.

Demographics	N	Effect Size	CI low	CI high
non-URM	381	1.59	1.35	1.85
URM	28	1.32	0.57	2.77

## First Generation Status

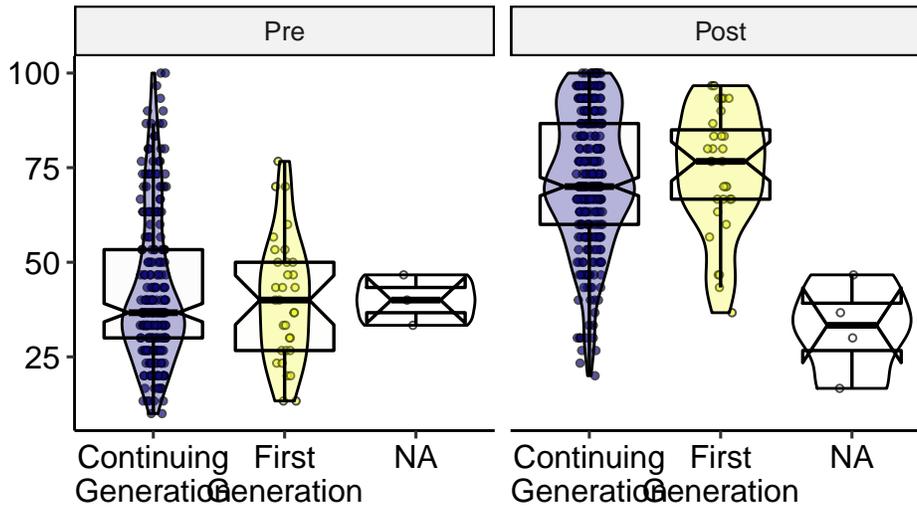


Figure 9: Distributions of test scores by first generation status.

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## Warning: Factor `continuing_gen` contains implicit NA, consider using
## `forcats::fct_explicit_na`
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Table 12: Summary statistics disaggregated by first generation status.

Status	Time	N Total	N Completed	Mean	Std. Dev
Continuing Generation	Pre	375	229	42.61	20.03
Continuing Generation	Post	375	296	71.97	17.92
First Generation	Pre	42	32	40.21	16.28
First Generation	Post	42	31	73.98	16.36
NA	Pre	133	3	40.00	6.67
NA	Post	133	4	32.50	12.58

Table 13: Shifts in scores disaggregated by first generation status.

Status	N	Effect Size	CI low	CI high
Continuing Generation	375	1.54	1.33	1.79
First Generation	42	2.04	1.48	2.84